



10/538219

(43) International Publication Date
1 July 2004 (01.07.2004)

PCT

(10) International Publication Number
WO 2004/055921 A3(51) International Patent Classification⁷: H01L 51/20

(21) International Application Number:

PCT/IB2003/005744

(22) International Filing Date: 5 December 2003 (05.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02102754.5 13 December 2002 (13.12.2002) EP

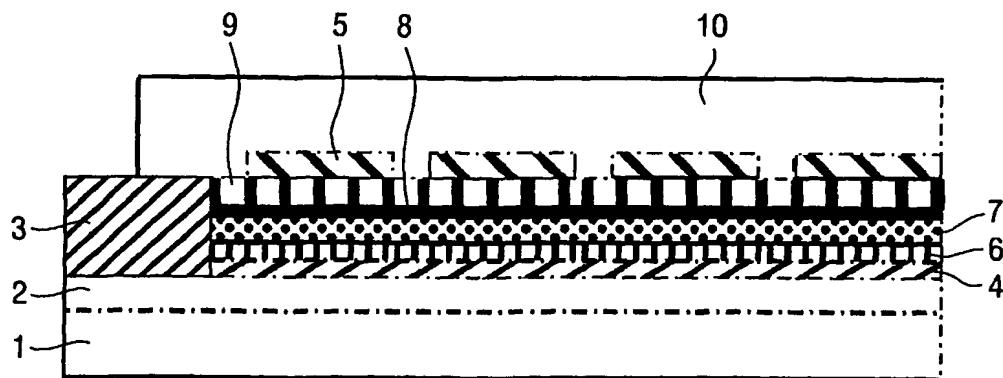
(71) Applicant (for DE only): PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH [DE/DE]; Stein-damm 94, 20099 Hamburg (DE).

(71) Applicant (for AE, AG, AL, AM, AT, AU, AZ, BA, BB, BE, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CY, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, FR, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, SZ, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW only): KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventor; and

(75) Inventor/Applicant (for US only): BOERNER, Herbert, Friedrich [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weissausstr. 2, 52066 Aachen (DE).

(54) Title: ORGANIC ELECTROLUMINESCENT COMPONENT WITH TRIPLET EMITTER COMPLEX



(57) **Abstract:** An organic electroluminescent component having a layer composite, which comprises a) a substrate layer b) a first transparent electrode layer, c) a mixing layer having c.1) a matrix of a conductive organic material with one or more singlet states and one or more triplet states, selected from the group: p-conductive and n-conductive materials, c.2) in this matrix, a light-emitting material which contains a metallo-organic complex compound with an emissive triplet state, and d) a second electrode, the lowest-energy triplet state of the conductive organic material being higher than the emissive triplet state of the metallo-organic complex compound by an energy difference E_t .

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L51/

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/93642 A (UNIV PRINCETON) 6 December 2001 (2001-12-06)	1
A	page 6, line 20 - page 7, line 6 claims 1,2	2
X	V. ADAMOVICH ET AL: "High efficiency single dopant white electrophosphorescent light emitting diodes" NEW JOURNAL OF CHEMISTRY, vol. 26, 12 August 2002 (2002-08-12), pages 1171-1178, XP008037151 page 1175, column 1, line 23 - line 56	1,2
A	DE 44 28 450 A (PHILIPS PATENTVERWALTUNG) 15 February 1996 (1996-02-15) cited in the application the whole document	1,6
		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 October 2004	02/11/2004
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer De Laere, A

INTERNATIONAL SEARCH REPORT

International Application No

IB 03/05744

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02/074015 A (FORREST STEPHEN R ; THOMPSON MARK E (US); UNIV PRINCETON (US); UNIV SO) 19 September 2002 (2002-09-19) abstract	1
P, X	HOLMES R J ET AL: "Blue organic electrophosphorescence using exothermic host-guest energy transfer" APPLIED PHYSICS LETTERS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 82, no. 15, 14 April 2003 (2003-04-14), pages 2422-2424, XP012033750 ISSN: 0003-6951 the whole document	1,2

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO 0193642	A 06-12-2001	US 6645645 B1		11-11-2003
		AU 6514301 A		11-12-2001
		WO 0193642 A1		06-12-2001
		US 2004100189 A1		27-05-2004
DE 4428450	A 15-02-1996	DE 4428450 A1		15-02-1996
		DE 59507560 D1		10-02-2000
		DE 69514495 D1		17-02-2000
		DE 69514495 T2		10-08-2000
		EP 0697744 A1		21-02-1996
		EP 0723701 A1		31-07-1996
		WO 9605607 A1		22-02-1996
		JP 8319482 A		03-12-1996
		JP 2002516629 T		04-06-2002
		US 5698858 A		16-12-1997
		US 5756224 A		26-05-1998
WO 02074015	A 19-09-2002	EP 1374320 A2		02-01-2004
		JP 2004526284 T		26-08-2004
		TW 540252 B		01-07-2003
		WO 02074015 A2		19-09-2002
		US 2004155238 A1		12-08-2004